

MEDICAL AND HEALTHCARE APPLICATIONS OF EVOLUTIONARY COMPUTATION

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Evolutionary Computation methods are being more and more frequently used to face challenging problems in Medicine and HealthCare.

These methods can be of great help in finding good solutions to many practical medical and healthcare applications, as for example in tasks as disease screening, diagnosis, treatment planning, prognosis, imaging, signal processing, healthcare management and any other task related to machine learning, knowledge discovery, decision support, regression, forecasting, optimization, feature selection and data mining.

The Special Session aims to bring together international experts in evolutionary computation for the exchange of ideas across disciplines encouraging multidisciplinary research collaborations and the development of new concepts in the important and growing domain of Medical and HealthCare ICT, thus creating a forum of excellence on the use of evolutionary inspired methods to face medical and healthcare problems.

This increasing trend towards the use of Evolutionary Computation methods to face challenging medical and healthcare problems in the next years, not only will a Special Session on this topic be of immediate relevance, it will also provide a platform for encouraging implementations of evolutionary methods for solving problems in various medical and healthcare specialties.

Topics

- Medical imaging (image analysis by detection, segmentation, registration, classification of pathological patterns, ...)
- Medical signal and data processing (analysis of biosignals, automated systems for detection of abnormal biomedical signals, detection of relevant biomedical patterns,



multi-scale signal processing, ...)

- Clinical diagnosis and therapy (knowledge discovery of relevant diagnostic parameters, data mining to discover new information, processing of large volumes of heterogeneous medical data, classification, clustering, regression models in diagnosing diseases, earlier diagnosis of disease, disease prediction, prediction of how diseases propagate, ...)
- Modelling and simulation of medical processes (modelling of medical processes to avoid mistakes or to systematically improve decision making and practice, error, vulnerability, and inefficiencies detection, simulation of multi-agent concurrent activities, ...)
- Decision support and therapy (clinical decision support systems, automatic clinical diagnosis, treatment schedule, therapy planning, ...)
- Evolutionary algorithms for chronic disease management (disease measure estimates, identification of symptoms, ...)
- Personalization of knowledge, care and devices (mining models of the patient, personalized clinical diagnosis, adaptation of medical devices to individual patients, ...)
- Healthcare modeling and healthcare simulation (physicians/patient support systems, population modelling systems, ...)
- Sanitary systems, ehealth, mhealth, sensors (e-solutions for clinical systems, wearable devices, body sensors, multi-sensor data fusion, ...)